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CLAIMS

What is claimed is:

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An optical router in an optical communication system for routing 1. 1 multiplexed signals having a plurality of wavelengths that create a spectrum through the 2 communication system by spatially shifting the wavelengths, said optical router including an 3 output element comprising: 4 a linear element for receiving the signals having the plurality of wavelengths and 5 for dispersing the spectrum into discrete regions onto an intermediate image plane; 6 a discontinuous optical element in optical communication with the intermediate 7 image plane for laterally shifting the discrete regions by predetermined lengths to produce a 8 laterally shifted spectrum, each of said predetermined lengths being associated with one of the 9 discrete regions; and 10 a re-imaging optical element for receiving the laterally shifted spectrum and for 11 removing the dispersion created by said linear element and for re-imaging the spectrum onto the 12 output element. 13 The optical router of claim 1, wherein said linear element comprises a 2. 1 micro-optic array. 2 The optical router of claim 2, wherein said micro-optic array comprises a 3. 1 plurality of input fibers each is adapted to transmit one of the plurality of wavelengths. 2

The optical router of claim 1, wherein said linear element comprises a

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micro-electromechanical structure tilt mirror that is electromechanically actuatable. 2 The optical router of claim 1, wherein said discontinuous optical element 5. 1 comprises a grating. 2 The optical router of claim 5, wherein said grating comprises a silicon 6. 1 wafer and a plurality of v-shaped grooves defined in the silicon wafer. 2 The optical router of claim 1, wherein said discontinuous optical element 7. 1 comprises a micro-electromechanical structure (MEMS) tilt mirror plate. 2 The optical router of claim 1, wherein said re-imaging optical element 8. 1 comprises a lens for receiving the spatially shifted spectrum and a grating for removing the 2 dispersion and focusing the received spatially diffused spectrum onto the output element of the 3 4 router. The optical router of claim 1, wherein said re-imaging element comprises 9. 1 a concave mirror. 2 A method for routing optical signals having a plurality of wavelengths that 10. 1 create a spectrum through an optical communication system by spatially shifting the 2 wavelengths, comprising the steps of: 3 linearly imaging the spectrum into discrete regions and onto an intermediate 4 image plane, wherein the imaging step introduces linear dispersion into the spectrum: 5

laterally shifting the discrete regions by predetermined lengths to produce a

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- laterally shifted spectrum, each of said predetermined lengths being associated with one of the 7 discrete regions; and 8 re-imaging the laterally shifted spectrum to remove the linear dispersion 9
- introduced by said imaging step and for outputting the latterly shifted spectrum onto an output 10 element in the optical communication system. 11
- The method of claim 10, wherein said shifting step comprises diffracting 11. 1 the spectrum to introduce lateral space shifts to the discrete regions. 2
- The method of claim 11, wherein said shifting step further comprises 12. 1 reflecting the laterally spaced shifted spectrum with an array of reflecting mirrors before re-
- imaging the spectrum. 3
- The method of claim 10, wherein said re-imaging step further comprises 13. 1
- reflecting the shifted, linearly dispersed spectrum through an element for removing the linear 2
- 3 dispersion.

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